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GROUNDWATER MONITORING WORK PLAN 2005
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

GROUNDWATER MONITORING WORK PLAN 2005
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

by

Haley & Aldrich, Inc.
San Diego, California

for

Boeing Realty Corporation
Long Beach, California

File No. 28882-103
24 November 2004

HALEY & ALDRICH

GROUNDWATER MONITORING
WORK PLAN 2005

BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

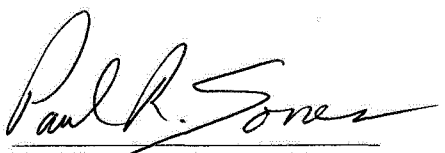
Prepared for

BOEING REALTY CORPORATION
4900 Conant Street
Building 1
Long Beach, CA 90808

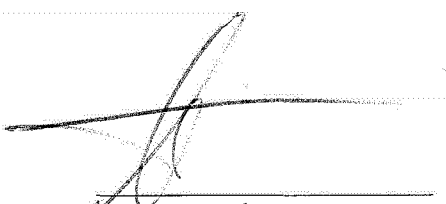
24 November 2004

Prepared by

HALEY & ALDRICH, INC.
9040 Friars Road, Suite 220
San Diego, California 92108
(619) 280-9210



Paul R. Sones, R.G. #6195
Senior Hydrogeologist



Scott P. Zachary
Project Manager

HALEY & ALDRICH

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1. INTRODUCTION

This work plan has been prepared for continuing groundwater monitoring at the Boeing Realty Corporation's (BRC) Former C-6 Facility (Site) in Los Angeles, California (Figure 1). A total of 44 groundwater monitoring events have been performed since 1987. Three monitoring events are planned for 2005, including:

- A Site-wide annual event in March;
- A plume boundary specific, semi-annual monitoring event in September; and
- A quarterly sampling event in December of 2005 of 8 new groundwater monitoring wells scheduled to be installed by September of 2005.

This work plan identifies the groundwater monitoring wells that will be sampled and chemicals that will be analyzed during each event. This sampling program is in addition to the groundwater monitoring program being performed under the general Waste Discharge Requirements (WDRs), Order No. R4-2002-0030: Series 007 for the Site groundwater bioremediation program. Results from the WDR monitoring program will be presented in separate reports. The following sections of this work plan present the Site background, the proposed groundwater monitoring program, and reporting.

1.1 Background

1.1.1 Site Geology

The Site is located on the Torrance Plain physiographic area of the West Coast Basin. Groundwater monitoring wells and soil borings drilled at the Site have encountered the Lakewood Formation, consisting of two major Hydrostratigraphic Units: the Bellflower Aquitard and the Gage Aquifer. Groundwater monitoring wells at the Site have only been installed within the Bellflower Aquitard, which extends to a depth of approximately 140 feet below ground surface (bgs). The top 20 to 50 feet of the Bellflower Aquitard below the Site consists of fine-grained soils (predominantly fine sands, silts, and clays) which thicken to the east. A sandy zone that dips downward to the east underlies the fine-grained soils. The sandy zone is generally 80 to 100 feet thick and contains discontinuous layers of fine-grained sediment that also dip downward to the east. The sandy unit is underlain by another fine-grained zone at depths of approximately 110 to 140 feet bgs.

1.1.2 Site Hydrogeology

Groundwater conditions at the Site are reasonably understood from previous investigations and groundwater monitoring events (Kennedy/Jenks Consultants, 2000a, and England Geosystem/Haley and Aldrich, Inc., 2001, and Haley and Aldrich 2002a). Groundwater at the Site is located in sediments of the Bellflower Aquitard,

which has two sub-units, the Middle Bellflower Aquitard and the Lower Bellflower Aquitard. The uppermost groundwater appears to be under water table conditions, at depths of 60 to 70 feet bgs. Most of the Site groundwater monitoring wells are screened near the water table at depths ranging from 55 to 90 feet bgs. Two deeper wells, WCC-1D and WCC-3D, were screened in a deeper zone at approximately 115 to 140 feet bgs, and have since been abandoned.

The Site-specific water-bearing units of the Middle Bellflower Aquitard (MBA) and the Lower Bellflower Aquitard (LBF) (Poland and others, 1959 and Department of Water Resources [DWR], 1961) are described below.

The Middle Bellflower Aquitard is a massive, light yellowish brown, fine to medium sand with local silt and clay zones. A fine-grained silt and clay layer, referred to as the Middle Bellflower mud (MBFM), locally interrupts this sand. Where divided, the top sand subunits are referred to as the B-Sand (MBFB); the bottom sand subunits as the C-Sand (MBFC).

The B-Sand is found at an approximate depth of 60 to 72 feet bgs at the Site, and is generally from 25 to 40 feet thick. The B-Sand predominantly consists of interbedded fine sands and silts. Groundwater flow within the B-Sand is predominantly to the south, with an approximate gradient of 0.001 ft/ft.

The uppermost groundwater at the Site occurs within the B-Sand at depths of 60 to 70 feet bgs. Most of the groundwater monitoring wells at the Site are completed within the B-Sand. Groundwater monitoring well completion information is summarized in Table I.

The MBFM is discontinuous in the Site area, and comprised of laminated silts, laminated clays, and very fine sands. Thickness of the MBFM ranges from approximately 3 to 13 feet. The MBFM thins and appears to be absent in the northern portion of the Site.

The C-Sand is found at an approximate depth of 97 to 107 feet bgs at the Site, and extends to a depth of up to approximately 125 feet bgs. The C-Sand predominantly consists of interbedded medium-to-fine sands. Groundwater flow within the C-Sand is reported to be to the southeast (Kennedy Jenks Consultants, 2000b).

The fine-grained Lower Bellflower Aquitard (LBF) occurs at an approximate depth of 114 to 150 feet bgs and ranges in thickness from 10 to 25 feet. The LBF separates the Bellflower sands from the underlying Gage Aquifer. The Gage Aquifer in the Site vicinity is predominantly sand and ranges in thickness from 40 to 78 feet thick. No groundwater monitoring wells are screened in the LBF or Gage Aquifer at the Site.

1.2 Historical Groundwater Monitoring Events

Groundwater information at the Site is provided by four primary sources:

- Groundwater monitoring wells installed at the Site by BRC and its predecessors (prefixes include WCC, TMW, CMW, MWB and MWC);
- Groundwater monitoring wells installed on the Site by International Light Metals (ILM) for investigations at ILM (prefixes DAC and BL);
- Groundwater monitoring wells installed on the Site by Montrose Chemical Corporation (Montrose) for investigations at Montrose (prefix XMW); and
- Bioremediation groundwater monitoring wells installed on the Site by BRC (prefixes IRZ).

Groundwater investigations began in early 1987 with the installation of groundwater monitoring well WCC-1S. A total of 55 groundwater monitoring wells have since been installed at the Site. Twenty-four of these groundwater monitoring wells have been abandoned as a result of redevelopment activities. Three of these 24 wells (TMW-01, TMW-02 and TMW-09) were abandoned during 2004 due to redevelopment activities.

The long-range groundwater monitoring needs for the Site were outlined in the Site-Wide Groundwater Monitoring Work Plan (Haley and Aldrich, 2003). This work plan proposed the installation of seven additional B-Sand and seven C-Sand monitoring wells as re-development access allowed. The LARWQCB approved this work plan on 28 May 2003. Eight of these groundwater monitoring wells (i.e., MWB012, MWB013, MWB014, MWB019, MWC015, MWC016, MWC017 and MWC021) were installed in the southern portion of the Site by the end of 2004 (Figure 2). The six remaining proposed monitoring wells consist of three B-Sand and three C-Sand monitoring wells in the northern portion of the Site. Two of the proposed B-Sand wells (i.e., MWB007 and MWB020), and the three C-Sand monitoring wells (i.e., MWC009, MWC011, and MWC022) will be installed during 2005, following redevelopment of the north portion of the Site (Figure 3). Installation of the one remaining B-Sand monitoring well proposed in the Site-Wide Groundwater Monitoring Work Plan will be re-evaluated during 2005. In addition to the groundwater monitoring wells proposed in the Site-wide Groundwater Monitoring Work Plan, three additional groundwater monitoring wells (i.e., MWB027, MWB006, and MWB028) will be installed to replace monitoring wells TMW-01, TMW-02, and TMW-09, which were abandoned in 2004 due to the redevelopment of the Site (Figure 3). There are a total of 31 existing, and eight proposed groundwater monitoring wells to be installed at the Site by the end of 2005. The existing, or proposed groundwater monitoring wells for the Site are shown on Figure 3. Actual and proposed completion details for the 39 groundwater monitoring wells to be sampled in 2005 are included in Table 1.

In addition to the 31 existing, and eight proposed groundwater monitoring wells at the Site, eight IRZ bioremediation groundwater monitoring were installed in the southern portion of the

Site in 2003 to monitor the effectiveness of the IRZ bioremediation program (Figure 2). One B-Sand (i.e., MWB003) and four C-Sand (i.e., MWC004, MWC006, MWC007, and MWC023) bioremediation monitoring wells will be installed in the northern portion of the Site in 2005 to monitor the effectiveness of the bioremediation program (Figure 3).

Approximately 44 groundwater monitoring events have taken place at the Site since monitoring began in 1987. All of the groundwater monitoring wells were typically sampled during each groundwater monitoring event, performed quarterly until 1997. In 2000, the groundwater monitoring program was modified to two events per year, one full annual monitoring event, and one semi-annual source area monitoring event (Kennedy Jenks Consultants, 2000b).

The most recent annual groundwater monitoring data were collected in March 2004. The associated report (Haley and Aldrich, Inc., 2004) describes a typical annual monitoring event for the Site:

- Twenty-four Site groundwater monitoring wells were gauged, purged and sampled.
- Water samples were analyzed for Volatile Organic Compounds (VOCs) by EPA Method 8260B.
- Quality Assurance/Quality Control samples (duplicate samples, trip blanks, and equipment blanks [one per day]) were collected and analyzed.

Results of the 2004 annual groundwater monitoring are summarized in the Annual Groundwater Monitoring Report (Haley and Aldrich, Inc., 2004). In general, groundwater conditions with respect to elevations, flow direction, and chemical concentrations are similar to previous years. An in-situ bioremediation system with 149 IRZ injection wells, 8 IRZ bioremediation monitoring wells were installed at the Site by the end of 2003. An expansion of the bioremediation system will be installed in the northern portion of the Site in 2005. Significant redevelopment activities, consisting of construction of new buildings and paved areas will also be performed during 2005. Based on the current Site conditions and re-development plans, the following sections present the proposed 2005 groundwater monitoring program.

2. PROPOSED GROUNDWATER MONITORING PROGRAM

The proposed 2005 groundwater monitoring program consists of three sampling events:

- Annual Site-wide monitoring (March 2005);
- Semiannual plume boundary-specific and eight new well monitoring (September 2005); and
- Quarterly monitoring of eight new monitoring wells (December 2005).

The above events are described in Sections 2.1, 2.2, and 2.3. General monitoring considerations are described in Section 2.4. Details of the groundwater monitoring are described in Table 2, and Figures 2, 3, and 4. As stated previously, this monitoring is in addition to the WDR-specific groundwater monitoring being performed at the Site.

2.1 Annual Groundwater Monitoring

The Site-wide annual monitoring event will be performed in March 2005. The routine groundwater monitoring program described in Section 2.4.2 will be performed at 29 groundwater monitoring wells, as indicated in Table 2. Depth to groundwater will be measured in 31 groundwater monitoring wells. Groundwater monitoring wells WCC-06S, TMW-07 and TMW-08 may be capped below grade for protection during Site redevelopment activities, and may not be available for the March annual event. If available, groundwater elevation data collected from the IRZ bioremediation monitoring wells will also be utilized. Groundwater samples will be collected and analyzed for VOCs by EPA Method 8260B. Dissolved oxygen (DO) and oxidation-reduction potential (ORP) parameters will also be measured in the field for wells according to Table 2. The monitoring methodology is presented below in Section 2.4.

If select wells cannot be accessed due to Site redevelopment activities, they will be scheduled for gauging and sampling either during the semiannual event in September, or during the quarterly event in December. Groundwater monitoring wells installed on the Site by Montrose and ILM will be sampled through coordination with their respective environmental contractors.

2.2 Semiannual Groundwater Monitoring

The semiannual monitoring event will be performed in September 2005. The routine groundwater monitoring program, described in Section 2.4.2, will be performed at a reduced number (14) of groundwater monitoring wells and will focus on the boundaries of the groundwater plumes, as indicated in Table 2 and shown on Figure 3). Depth to groundwater will be measured in 39 groundwater monitoring wells listed in Table 2. The wells to be sampled in the reduced semiannual program were selected to monitor the boundaries of the groundwater plume and down-gradient conditions, and to provide the initial sampling of the

eight additional groundwater monitoring wells to be installed in 2005 (if available). Samples collected during the semiannual event will be tested for VOCs by EPA Method 8260B (Table 2). DO and ORP parameters will also be measured in the field for wells according to Table 2. The monitoring methodology is presented below in Section 2.4.

2.3 Quarterly Groundwater Monitoring

As described in Section 1.2, eight additional groundwater monitoring wells (i.e., MWB006, MWB007, MWC009, MWC011, MWB020, MWC022, MWB027 and MWB028) are to be installed in the northern portion of the Site in 2005 (Figure 4). When these additional monitoring wells are installed, they will be included in the monitoring program. It is anticipated that these wells will be installed prior to the September 2005 semiannual groundwater monitoring event. The Site-Wide work plan requires that the new wells be initially sampled following installation, and for three successive quarters. The first sampling event for these new wells will be performed during the September 2005 semiannual sampling event; the second monitoring event will be performed during the December 2005 quarterly sampling event. The third and fourth monitoring events for these new wells will be performed during the March 2006 annual, and the June 2006 quarterly sampling events. The routine monitoring program described in Section 2.4.2 will be performed on the eight new monitoring wells as indicated in Table 2 and shown on Figure 4. Groundwater samples will be collected and analyzed for VOCs by EPA Method 8260B. Dissolved oxygen (DO) and oxidation-reduction potential (ORP) parameters will also be measured in the field for wells according to Table 2. The monitoring methodology is presented below in Section 2.4.

2.4 Groundwater Monitoring Methodology

2.4.1 Health and Safety

The work will be performed under a Site-specific Health and Safety Plan (HSP) in accordance with the federal Occupational Safety and Health Act (OSHA). The existing HSP for groundwater monitoring at the BRC Former C-6 Facility was prepared on 8 June 2001, and updated by addendum on 30 October 2002 and 12 November (Haley and Aldrich, Inc., 2001a, 2001b, and 2002b). This HSP will be used by field staff while conducting field activities.

2.4.2 Fieldwork – Groundwater Monitoring and Sampling

BRC will notify the LARWQCB a minimum of one week prior to the start of groundwater monitoring events. The following activities will be performed:

2.4.2.2 Water Level Gauging

Prior to sampling each monitoring well, depth to groundwater will be measured in each well to the nearest one-hundredth of a foot using an electronic water level sounder. Data from the well gauging will be recorded

in the Well Gauging Data Sheet (Appendix A), as well as the Boeing Data Management Plan (DMP) in an electronic form for upload to the project database (Boeing EDMS, 2001). Monitoring well vapor concentrations will be measured with a photo-ionization detector (PID) following the removal of the well cap, and results will be recorded on the Well Gauging Data Sheet. During the one quarterly monitoring event (December 2005), only the eight new monitoring wells will be gauged. All of the existing Site monitoring wells will be gauged during the annual and semi-annual monitoring events in March and September 2005. If concurrent water level data from the IRZ bioremediation monitoring wells are available, these data will also be utilized. All of the groundwater monitoring wells will be gauged within a single 24-hour period with the same water sounding tape.

2.4.2.3 Well Purging and Sampling

Based on historical concentrations, groundwater monitoring wells will be sampled in order of increasing concentration. The results from the last annual monitoring event in March 2004 and the semiannual event performed in September 2004 were used to determine the sampling order for the March 2005 event (Table II). The sampling order for the September 2005 semiannual sampling event will be based on the results of the March 2004 annual event, and the sampling order for the December 2005 quarterly event will be based on the results from the September 2005 semiannual event.

Following well gauging, each well will be purged by extracting a minimum of three wetted well casing volumes of standing water with a pump. The depth to water, temperature, pH, and specific conductance will be measured and recorded periodically on a Groundwater Sampling Data Sheet (Appendix A) after each one-half wetted casing volume is purged from the well. Purging will be complete when a minimum of three wetted casing volumes have been removed and three consecutive measurements of specific conductance, pH, and temperature are within 10% of each other. If parameters do not stabilize after five casing volumes, purging will be complete. Dedicated tubing will be used for each well to minimize potential sampling equipment interference.

The intake of the submersible pump will be placed at a depth as close to the static water level as possible (within 2-feet). The purge rate will not exceed 2 gallons per minute (gpm) for 4-inch diameter wells and 1 gpm for 2-inch diameter wells. The water level will be monitored during purging and the purge rate will be adjusted so that the draw-down in the well is minimized to prevent groundwater from cascading down the interior sidewalls of the well casing.

Dissolved oxygen (DO) and oxidation reduction potential (ORP) parameters will also be measured in the field in select wells as per Table 2. These

parameters will be collected and recorded in accordance with the Standard Operating Procedures for Measuring Natural Attenuation Parameters (England Geosystem and Haley and Aldrich, 2001).

After well purging parameters have stabilized, the pumping rate will be decreased to less than 0.1 gpm, and groundwater samples will be collected from the pump discharge in appropriate containers. Samples will be stored on ice in a cooler and transported by courier to a California-certified analytical laboratory for analysis under proper chain-of-custody. Chain of custody forms will be maintained throughout sample collection and transport. An example of the chain of custody form is provided in Appendix A. The appropriate chain of custody information will also be electronically uploaded to the project database.

Equipment used for well purging and sampling will be cleaned prior to and between groundwater monitoring wells with an Alconox solution (or equivalent), then double-rinsed with tap water and deionized or distilled water to reduce the potential for cross-contamination. Well purge water and water used to decontaminate equipment will be stored in properly labeled, DOT 55-gallon drums and stored on-Site at a location selected by BRC. The drums will be properly manifested and disposed of by BRC following receipt of laboratory results.

Groundwater analytical results will be reported on RWQCB Laboratory Report Forms 10A/10B or their equivalent in units of milligrams per liter (mg/L) or micrograms per liter (µg/L). Field data will be collected and recorded on standard groundwater monitoring forms, in accordance with the Boeing Electronic DMP (Boeing EDMS, 2001).

The laboratory reports will be submitted electronically to the firm that will provide project data management.

2.4.3 Quality Assurance/Quality Control

2.4.3.1 Duplicate Samples

One duplicate groundwater sample will be collected for every 20 groundwater samples as a check for sample homogeneity and laboratory accuracy (2 samples in March and September, and 1 sample in December). Duplicates will be collected, numbered, packaged, and sealed in the same manner as the other samples. Duplicates will be assigned separate sample numbers and submitted blind to the laboratory. Duplicate samples will be analyzed for VOCs by EPA Method 8260B.

2.4.3.2 Rinsate Blanks

One equipment rinsate blank sample will be collected prior to initiation of sampling activities as a check for cross-contamination during sample collection. Another rinseate sample will be collected each day throughout the duration of the sampling event when sampling equipment is cleaned and re-used in the field (an estimated 6 samples in March, 5 samples in September, and 2 samples in December). Deionized water will be used to fill or rinse the sampling equipment after the equipment has been cleaned, then collected in the sample containers. The equipment rinsate blanks will be analyzed for VOCs by EPA Method 8260B.

2.4.3.3 Field Blanks

One field blank will be collected each day with laboratory supplied water to check for contamination by sampling methodology (an estimated 6 samples in March, 5 samples in September, and 2 samples in December). The field blanks will be analyzed for VOCs by EPA Method 8260B.

2.4.3.4 Decontamination Water

One water sample will be collected each field day from the water used for decontamination of the sampling equipment (an estimated 6 samples in March, 5 samples in September, and 2 samples in December). The decontamination water sample will be analyzed for VOCs by EPA Method 8260B.

2.4.3.5 Travel Blanks

One travel blank will be prepared in the laboratory for each day that groundwater samples are collected and shipped to the laboratory (an estimated 6 samples in March, 5 samples in September, and 2 samples in December). The travel blanks will be prepared in a clean environment and kept in the cooler used to ship samples. The travel blank provides a check for cross-contamination during transport, and will be analyzed for VOCs by EPA Method 8260B.

2.4.4 Data Validation

A subcontractor (Laboratory Data Consultants, Inc. [LDC]) will perform three levels of data validation: Tier 1, Tier 2, and Tier 3 validation. The validation process will follow the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA, 1999 and 2002). Approximately 10% of the laboratory data will be reviewed during each monitoring event to ensure that the data are of sufficient quality (3 samples from the March annual event, 1 sample from the June quarterly event, and 2 samples from the

September semi-annual event). The data packages to be validated will be selected randomly. Approximately 55% of the data will be subjected to Tier 1 validation, 40% will be subjected to Tier 2 validation, and 5% will be subjected to Tier 3 validation.

3. GROUNDWATER MONITORING REPORT

The report for the annual groundwater monitoring event will contain the following:

- Groundwater elevation contour maps for the B-Sand and the C-Sand water bearing units;
- Tables and figures that depict groundwater analytical results;
- Groundwater sampling forms and field notes documenting field activities;
- Laboratory reports and chain of custody documentation;
- Appropriate descriptions of the sampling event, test results, and discussion and conclusions regarding water quality and hydrogeologic changes at the Site;
- Discussion of changes in Site/well conditions that might affect future sampling events; and
- Recommendations for modifications to the sampling program, if necessary.

The report for the semiannual groundwater monitoring event will contain the following:

- Groundwater elevation contour maps for the B-Sand and the C-Sand water bearing units;
- Tables presenting the groundwater analytical results;
- Groundwater sampling forms and field notes documenting field activities; and
- Laboratory reports and chain of custody documentation;

Reports will be submitted to the LARWQCB approximately 60 days after the receipt of laboratory results from each sampling event. With the annual and semiannual monitoring events occurring in March and September 2005, reports for these events will be provided to the LARWQCB by 31 May and 30 November 2005. The results from the December 2005 quarterly sampling will be included in the report for the March 2006 annual sampling event. The reports will consist of a hard copy of text, tables, figures, and analytical data. An electronic version of the report on compact disc will also be provided with the hard copy document.

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TABLES

TABLE I
GROUNDWATER MONITORING WELL COMPLETION INFORMATION
BOEING REALTY CORPORATION, FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

Name	Water Bearing Unit	Easting[1]	Northing[1]	Top of Casing Elevation (AMSL)[2, 3, 4]	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size	Drilled Date
WCC-3S	B-Sand	12608.52	13238.90	51.12	92	69-89	64	4	Sched 40 PVC	0.010-Inch	10/26/1987
WCC-4S	B-Sand	12741.35	13075.30	49.62	92	70.5-90.5	65	4	Sched 40 PVC	0.010-Inch	10/27/1987
WCC-5S	B-Sand	12963.90	12998.70	48.79	91	61-91	64	4	Sched 40 PVC	0.010-Inch	11/24/1987
WCC-6S	B-Sand	12580.24	12953.10	51.30	91	60-90	54	4	Sched 40 PVC	0.010-Inch	9/22/1989
WCC-7S	B-Sand	12730.37	12868.65	50.20	91	60-90	54	4	Sched 40 PVC	0.010-Inch	6/8/1989
WCC-9S	B-Sand	12928.87	12627.94	57.40 [5]	92	60-90	55	4	Sched 40 PVC	0.010-Inch	9/21/1989
WCC-12S	B-Sand	12749.26	12715.21	46.92	92	60-90	55	4	Sched 40 PVC	0.010-Inch	9/17/1990
DAC-P1	B-Sand	11194.86	12988.63	52.75	90	60-90	55	4	Sched 40 PVC	0.010-Inch	9/25/1989
TMW-4	B-Sand	12498.69	12334.70	48.79	84	58-78	56	2	Sched 40 PVC	0.010-Inch	6/30/1998
TMW-6	B-Sand	12552.93	11936.32	49.50	93	67-87	66	2	Sched 40 PVC	0.010-Inch	7/1/1998
TMW-7	B-Sand	12560.70	12701.25	52.52	91	65-85	63	2	Sched 40 PVC	0.010-Inch	6/29/1998
TMW-8	B-Sand	12571.93	12812.42	53.99	90	61-81	59	2	Sched 40 PVC	0.010-Inch	6/29/1998
TMW-10	B-Sand	12968.14	12170.61	47.48	85	60.5-80.5	58	2	Sched 40 PVC	0.010-Inch	1/28/1999
TMW-11	B-Sand	12968.08	11423.04	47.41	83	58-78	55	2	Sched 40 PVC	0.010-Inch	2/1/1999
TMW-14	B-Sand	11797.06	11416.11	58.91 [5]	90	65-85	63	2	Sched 40 PVC	0.010-Inch	2/3/1999
TMW-15	B-Sand	11800.22	12165.10	55.23	92	62-87	60	2	Sched 40 PVC	0.010-Inch	2/4/1999
BL-3	B-Sand	11207.79	11961.46	56.48	79	59-79	56	2	Sched 40 PVC	0.010-Inch	2/8/1999
Montrose Wells											
XMW-09	B-Sand	12654.36	11148.11	53.16 [5]	-	66-81	-	4	-	-	5/9/1989
XMW-19	B-Sand	12968.08	11757.92	46.53	-	63-79	-	4	-	-	3/30/1990
Wells Installed in 2003											
MW0005	B-Sand	6470243	1769060	49.57	87	65-85	63	4	Sched 40 PVC	0.010-Inch	8/8/2003
CMW0001	C-Sand	6470711	1768180	54.37 [5]	124	99-124	97	4	Sched 40 PVC	0.010-Inch	8/15/2003
CMW0002	C-Sand	6470556	1767936	52.81 [5]	124	99-124	97	4	Sched 40 PVC	0.010-Inch	9/5/2003
CMW026	C-Sand	6470290	1768600	48.94	117	92-117	90	4	Sched 40 PVC	0.010-Inch	8/6/2003
Wells Installed in 2004											
MWB012	B-Sand	6470065	1768993	52.43 [5]	90.5	64.5-84.5	62	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWB013	B-Sand	6469613	1769393	55.33 [5]	86.5	65-85	62	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWB014	B-Sand	6470281	1768401	51.69 [5]	86.5	65-85	62	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWB019	B-Sand	6469963	1768134	55.18 [5]	90.5	65-85	62	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWC015	C-Sand	6470239	1768805	51.51 [5]	128	100-125	126.5	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWC016	C-Sand	6469997	1768713	52.61 [5]	131	102.5-127.5	101	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWC017	C-Sand	6469979	1768134	55.16 [5]	128	100-125	99	4	Sched 40 PVC	0.010-Inch	5/17/2004
MWC021	C-Sand	6470724	1768929	54.53 [5]	126	97-122	95	4	Sched 40 PVC	0.010-Inch	5/17/2004
II to be Installed in 2005 [6]											
MWB006	B-Sand	TBD	TBD	TBD	~85	~65-85	~83	4	Sched 40 PVC	0.010-Inch	TBD
MWB007	B-Sand	TBD	TBD	TBD	~85	~65-85	~83	4	Sched 40 PVC	0.010-Inch	TBD
MWB009	B-Sand	TBD	TBD	TBD	~85	~65-85	~83	4	Sched 40 PVC	0.010-Inch	TBD
MWC011	C-Sand	TBD	TBD	TBD	~120	~100-120	~98	4	Sched 40 PVC	0.010-Inch	TBD
MWB020	B-Sand	TBD	TBD	TBD	~85	~65-85	~83	4	Sched 40 PVC	0.010-Inch	TBD
MWC022	C-Sand	TBD	TBD	TBD	~120	~100-120	~98	4	Sched 40 PVC	0.010-Inch	TBD
MWB027	B-Sand	TBD	TBD	TBD	~85	~65-85	~83	4	Sched 40 PVC	0.010-Inch	TBD
MWB029	B-Sand	TBD	TBD	TBD	~85	~65-85	~83	4	Sched 40 PVC	0.010-Inch	TBD

1 Local coordinate system (feet)
2 AMSL = Above Mean Sea Level - Wells were surveyed March 19, 2002 & September 13, 2002 by Tait & Associates.
3 Wells TMW-4 and TMW-6 were cut down during redevelopment activities. These wells were re-surveyed by Thienes Engineering, Inc. in October 2003.
4 Wells installed in 2004 were surveyed by Tait & Associates in May 2004.
5 Wells resurveyed by Tait in November 2004.
6 Groundwater monitoring wells planned to be installed by end of 2005, data are proposed values.
- = not available
TBD = to be deceided

QA/QC: PRS
Date: 11/22/04

TABLE II
2005 GROUNDWATER MONITORING WORK PLAN - ANALYTICAL PROGRAM
BOEING REALTY CORPORATION, FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

Name	Water-bearing Unit	Sampling Order (March 2005) [1]	Annual Event Analytical Program March 2005			Sampling Order (September 2005) [2]	Semiannual Event Analytical Program September 2005			Sampling Order (December 2005) [3]	4th Quarterly Event Analytical Program December 2005		
			Water Level Gauging	VOCs (8260B)	DO and ORP		Water Level Gauging	VOCs (8260B)	DO and ORP		Water Level Gauging	VOCs (8260B)	DO and ORP
Existing Groundwater Monitoring Wells													
WCC-3S	B-Sand	24	x	x	x		x						
WCC-4S	B-Sand	19	x	x	x		x						
WCC-5S	B-Sand	1	x	x	x		x	x	x				
WCC-6S	B-Sand	18	x [6]	x [6]	x [6]		x						
WCC-7S	B-Sand	14	x	x	x		x						
WCC-9S	B-Sand	11	x	x	x		x	x	x				
WCC-12S	B-Sand	15	x	x	x		x						
DAC-P1	B-Sand	23	x	x	x		x						
TMW-04	B-Sand		x				x						
TMW-06	B-Sand	16	x	x	x		x						
TMW-07	B-Sand	27	x [6]	x [6]	x [6]		x						
TMW-08	B-Sand		x [6]				x						
TMW-10	B-Sand	3	x	x	x		x	x	x				
TMW-11	B-Sand	6	x	x	x		x	x	x				
TMW-14	B-Sand	7	x	x	x		x	x	x				
TMW-15	B-Sand	8	x	x	x		x	x	x				
BL-03	B-Sand	22	x	x	x		x						
XMW-09	B-Sand	9	x	x	x		x						
XMW-19	B-Sand	4	x	x	x		x						
MWB005 [4]	B-Sand	29	x	x	x		x						
MWB012 [4]	B-Sand	20	x	x	x		x						
MWB013 [4]	B-Sand	2	x	x	x		x	x	x				
MWB014 [4]	B-Sand	10	x	x	x		x						
MWB019 [4]	B-Sand	12	x	x	x		x	x	x				
CMW001 [4]	C-Sand	17	x	x	x		x	x	x				
CMW002 [4]	C-Sand	21	x	x	x		x	x	x				
MWC015 [4]	C-Sand	28	x	x	x		x						
MWC016 [4]	C-Sand	25	x	x	x		x						
MWC017 [4]	C-Sand	13	x	x	x		x	x	x				
MWC021 [4]	C-Sand	5	x	x	x		x	x	x				
CMW026 [4]	C-Sand	26	x	x	x		x						
Groundwater Monitoring Wells to be Installed by September 2005													
MWB006 [5]	B-Sand		NA	NA	NA		x	x	x		x	x	x
MWB007	B-Sand		NA	NA	NA		x	x	x		x	x	x
MWC009	C-Sand		NA	NA	NA		x	x	x		x	x	x
MWC011	C-Sand		NA	NA	NA		x	x	x		x	x	x
MWB020	B-Sand		NA	NA	NA		x	x	x		x	x	x
MWC022	C-Sand		NA	NA	NA		x	x	x		x	x	x
MWB027 [5]	B-Sand		NA	NA	NA		x	x	x		x	x	x
MWB028 [5]	B-Sand		NA	NA	NA		x	x	x		x	x	x
Quality Control Samples													
Duplicates (1 per 20 wells)				x (est. 2)				x (est. 1)				x (est. 1)	
Rinsate Blanks (1 per day)				x (est. 6)				x (est. 5)				x (est. 2)	
Field Blanks (1 per day)				x (est. 6)				x (est. 5)				x (est. 2)	
Decon Water (1 per day)				x (est. 6)				x (est. 5)				x (est. 2)	
Travel Blanks (1 per day)				x (est. 6)				x (est. 5)				x (est. 2)	

Notes:

est. = Quality control sample number estimated based on estimated number of sampling days.
DO = Dissolved Oxygen (Field Analysis)
ORP = Oxidation Reduction Potential (Field Analysis)
VOCs = Volatile organic compounds
8260B = EPA Method 8260B

[1] Sampling order for March 2005 will be based on results of March 2004 annual and September 2004 semi-annual events.

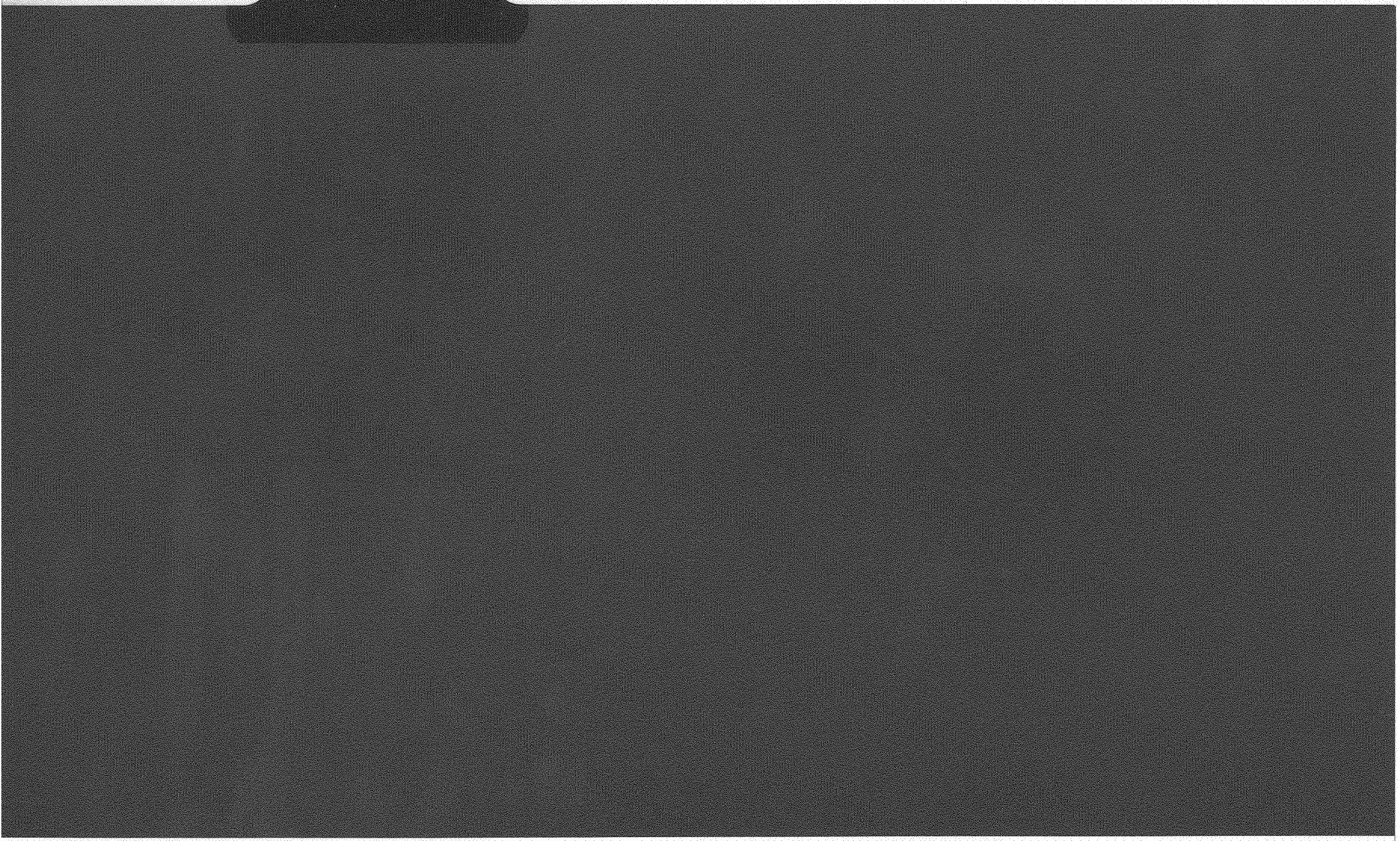
[2] Sampling order for September 2005 will be based on March 2005 results.

[3] Sampling order for December 2005 will be based on September 2005 results.

[4] Groundwater monitoring wells installed in 2004.

[5] Groundwater monitoring wells to be installed to replace TMW-01, TMW-02, and TMW-09 which were abandoned in October 2004 for Site redevelopment.

[6] Wells WCC-06S, TMW-07 and TMW-08 may be capped below grade for protection during redevelopment grading and construction. these wells should be re-exposed by the September 2005 semiannual event.



FIGURES

HALEY & ALDRICH

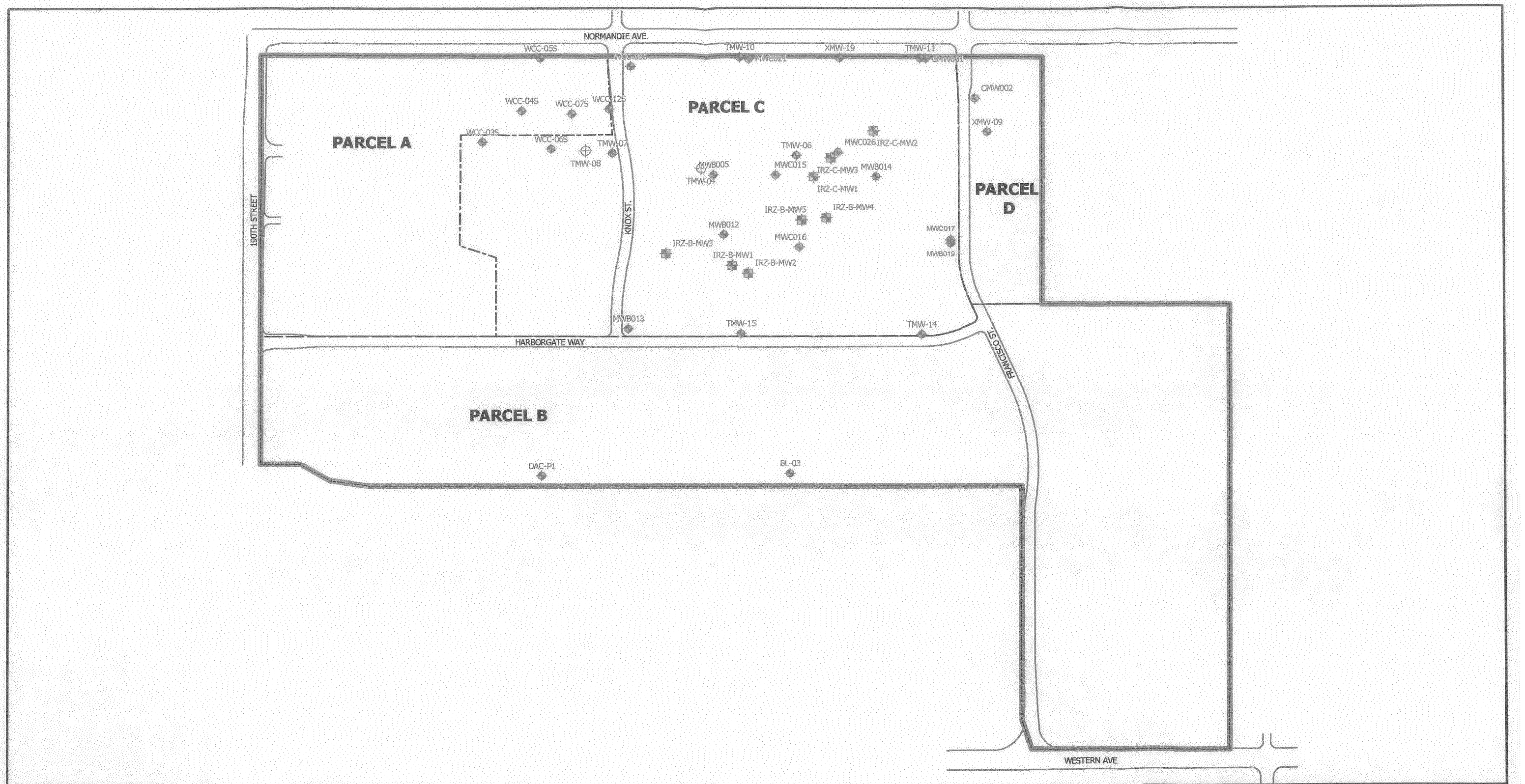
CREATIVE SOLUTIONS FOR CLIENT SUCCESS

BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

FIGURE 1

SITE LOCATION MAP

SCALE AS SHOWN



LEGEND

- B-Sand Groundwater Monitoring Well not to be Sampled Annually
- B-Sand Groundwater Monitoring Well to be Sampled Annually
- C-Sand Groundwater Monitoring Well to be Sampled Annually
- B-Sand IRZ Bioremediation Monitoring Well Concurrent Well Data to be Used if Available
- C-Sand IRZ Bioremediation Monitoring Well Concurrent Well Data to be Used if Available
- Property Boundary
- Parcel Boundary
- RightOfWay

N

All Locations and Dimensions are Approximate

0 200 400 800 Feet

HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

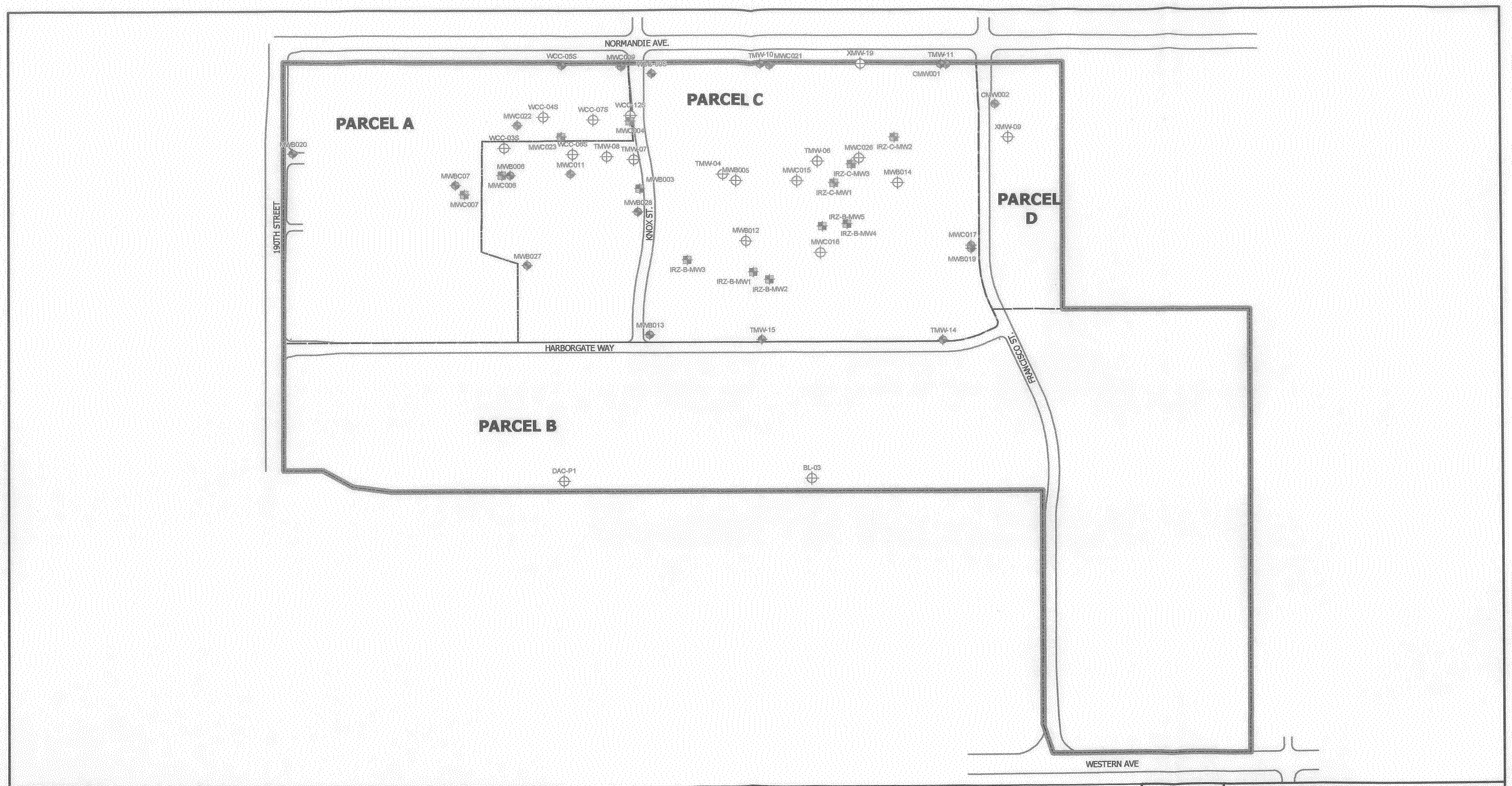
BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

FIGURE 2

GROUNDWATER MONITORING WELLS 2005 ANNUAL SAMPLING EVENT

SCALE AS SHOWN

NOVEMBER 2004



LEGEND

- B-Sand Groundwater Monitoring Well not to be Sampled Semiannually
- C-Sand Groundwater Monitoring Well not to be Sampled Semiannually
- B-Sand Groundwater Monitoring Well to be Sampled Semiannually
- C-Sand Groundwater Monitoring Well to be Sampled Semiannually
- B-Sand IRZ Bioremediation Monitoring Well Concurrent Well Data to be Used if Available
- C-Sand IRZ Bioremediation Monitoring Well Concurrent Well Data to be Used if Available
- Property Boundary
- Parcel Boundary
- RightOfWay

N

All Locations and Dimensions are Approximate

0 200 400 800 Feet

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BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

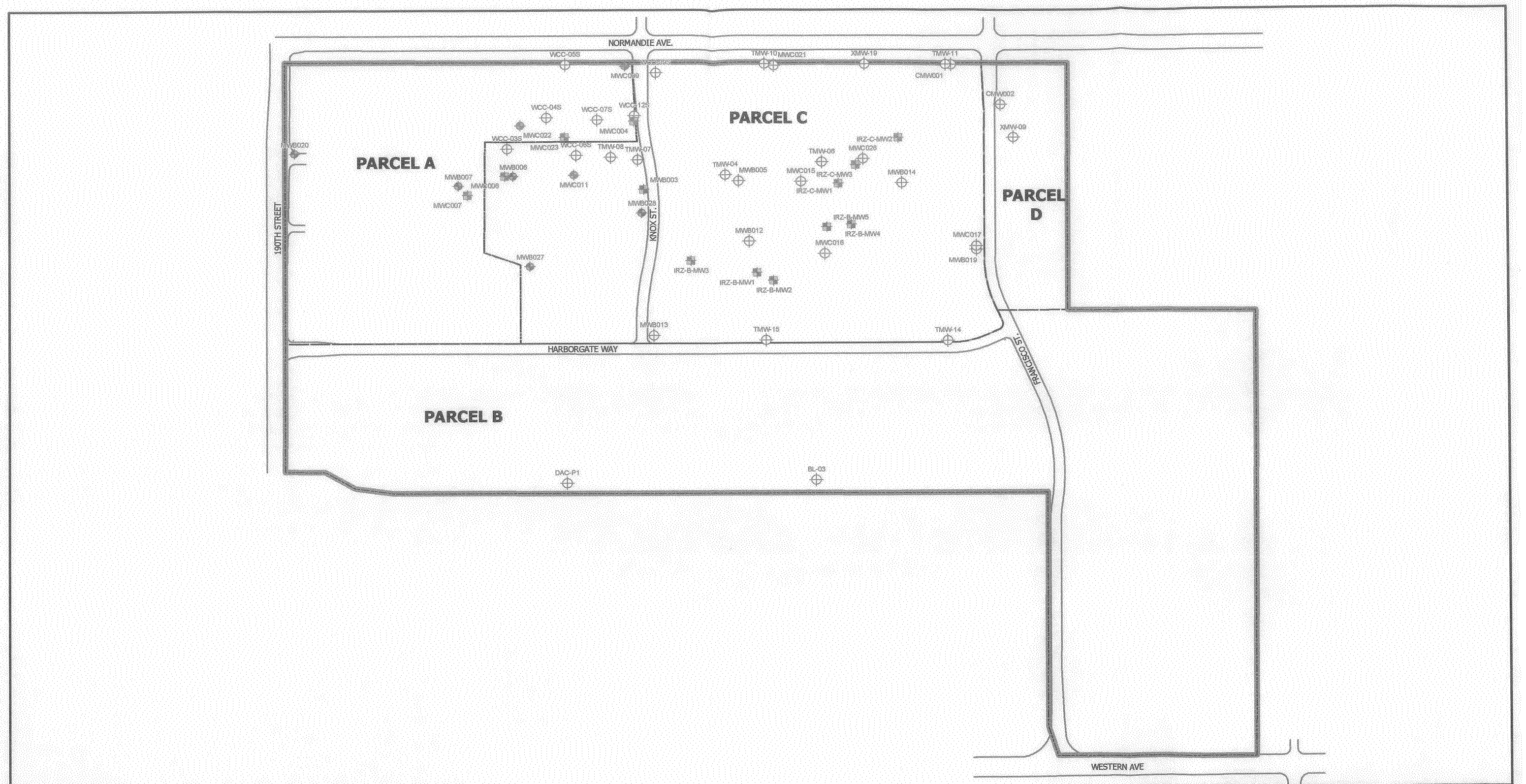
FIGURE 3

GROUNDWATER MONITORING WELLS 2005 SEMIANNUAL SAMPLING EVENT

SCALE AS SHOWN

NOVEMBER 2004

BOE-C6-0066820



LEGEND

- B-Sand Groundwater Monitoring Well not to be Sampled Quarterly
- C-Sand Groundwater Monitoring Well not to be Sampled Quarterly
- B-Sand Groundwater Monitoring Well to be Sampled Quarterly
- C-Sand Groundwater Monitoring Well to be Sampled Quarterly
- B-Sand IRZ Bioremediation Monitoring Well Concurrent Well Data to be Used if Available
- C-Sand IRZ Bioremediation Monitoring Well Concurrent Well Data to be Used if Available
- Property Boundary
- Parcel Boundary
- RightOfWay

N

All Locations and Dimensions are Approximate

0 200 400 800 Feet

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BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

FIGURE 4

GROUNDWATER MONITORING WELLS DECEMBER 2005 QUARTERLY SAMPLING EVENT

SCALE AS SHOWN

NOVEMBER 2004

BOE-C6-0066821

Appendix A

APPENDIX A

FIELD FORMS

Well Gauging Data Sheet

Site Name: _____

Well ID	Date	Time	PID (ppm)	Diameter (in)	Measurement Point	Depth to LNAPL (ft-bmp)	Depth to Water (ft-bmp)	LNAPL Thickness (ft)	Total Depth (ft bmp)	Personnel	Comments

Page ___ of ___

BOE-C6-006824